

Claims

[c1] *Sub A* 1. A substrate exposure apparatus, applicable to transfer a pattern to a photoresist on a surface of a substrate, the substrate exposure apparatus comprising:
a scan light source, disposed at a position spaced from a surface of the photoresist on the substrate with a distance, and the scan light source comprising a plurality of point light sources; and
a scan control system, converting the pattern into a timing signal to control light and dark status of each of the point light sources at different times, the scan control system further allows the substrate exposure apparatus to have a scan function, such that the scan light source scans the photoresist at least once along a scan path for exposure.

[c2] 2. The substrate exposure apparatus according to claim 1, wherein the substrate includes a printed circuit board.

[c3] 3. The substrate exposure apparatus according to claim 1, wherein the substrate includes a wafer.

[c4] 4. The substrate exposure apparatus according to claim 1, wherein the substrate includes various types of package substrates.

[c5] 5. The substrate exposure apparatus according to claim 1, wherein the point light sources are arranged into one line light source.

[c6] 6. The substrate exposure apparatus according to claim 1, wherein the point light sources are arranged into a plurality of line light sources.

[c7] 7. The substrate exposure apparatus according to claim 6, wherein the line light sources are parallel to each other.

[c8] 8. The substrate exposure apparatus according to claim 7, wherein the point light sources in one of the line light sources has a position shift with respect to the point light source in another line light source along an aligning direction of the point light sources, so that the point light sources are staggered to enhance the exposure resolution.

[c9] 9. The substrate exposure apparatus according to claim 1, wherein the point light sources include either light emitting diodes or laser diodes.

[c10] 10. The substrate exposure apparatus according to claim 1, wherein the scan function is achieved by shifting the scan light source.

[c11] 11. The substrate exposure apparatus according to claim 1, wherein the scan function is achieved by shifting the substrate.

[c12] 12. The substrate exposure apparatus according to claim 1, further comprising a chaise to carry the substrate.

[c13] 13. The substrate exposure apparatus according to claim 12, wherein the scan function is achieved by shifting the chaise.

[c14] 14. The substrate exposure apparatus according to claim 1, further comprising a lens set located along the optical paths between the scan light source and the substrate.

[c15] 15. The substrate exposure apparatus according to claim 14, wherein the scan function is achieved by rotating at least a component in the lens set.

[c16] 16. The substrate exposure apparatus according to claim 14, wherein the scan function is achieved by shifting at least a component in the lens set.

[c17] 17. A substrate exposure method, to transfer a pattern to a photoresist on a surface of a substrate, comprising:
providing a scan light source at a distance spaced from a surface of the photoresist on the substrate with a distance, wherein the scan light source comprises a plurality of point light sources;
providing a control system, to convert the pattern into a timing signal to control light and dark status of each of the point light sources at different times, and to provide a scan function, so that the scan light source performs at least one scan along a scan path to expose the photoresist.

[c18] 18. The substrate exposure method according to claim 17, wherein the substrate includes a printed circuit board.

[c19] 19. The substrate exposure apparatus according to claim 17, wherein the substrate includes a wafer.

[c20] 20. The substrate exposure method according to claim 17, wherein the substrate includes various types of package substrates.

[c21] 21. The substrate exposure method according to claim 17, wherein the scan function is achieved by shifting the scan light source.

[c22] 22. The substrate exposure method according to claim 17, wherein the scan function is achieved by shifting the substrate.

[c23] 23. The substrate exposure method according to claim 17, wherein the substrate is carried by a chaise.

[c24] 24. The substrate exposure method according to claim 23, wherein the scan function is achieved by shifting the chaise.

[c25] 25. The substrate exposure method according to claim 17, wherein a lens set is disposed along the optical path between the scan light source and the substrate.

[c26] 26. The substrate exposure method according to claim 25, wherein the scan function is achieved by rotating at least one component in the lens set.

[c27] 27. The substrate exposure method according to claim 25, wherein the scan function is achieved by shifting at least one component in the lens set.

[c28] 28. The substrate exposure method according to claim 17, wherein the point light sources include either light emitting diodes or laser diodes.

[c29] 29. The substrate exposure method according to claim 17, wherein the point light sources are arranged into at least one line light source with an axis vertical to a scan direction, and at least one scan is performed.

[c30] 30. The substrate exposure method according to claim 17, wherein the point sources are arranged into at least one line light source with an axis not vertical to a scan direction, and at least one scan is performed.

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